

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Paul WANNINGER, et al.

Appln. No: 10/058,832

Confirmation No.: 2432

Filed: January 30, 2002

For: COMBUSTIBLE SHAPED  
AMMUNITION PART

Art Unit: 3641

Examiner: A. Felton

Atty. Docket No: 32140-177788

Customer No.

**26694**

PATENT TRADEMARK OFFICE

**BRIEF ON APPEAL**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

This Brief is filed with requisite fees which are authorized on concurrently filed transmittal forms; the fees include the fee for filing the Brief and an extension fee.

The Notice of Appeal was filed on August 3, 2004.

**REAL PARTY IN INTEREST**

The application is assigned to RHEINMETALL W&M GMBH.

**RELATED APPEALS AND INTERFERENCES**

The undersigned is not aware of another appeal or interference which will directly affect or be affected by the Board's decision in this case.

## **STATUS OF CLAIMS**

Claims 10-16 are under final rejection and are subject of this appeal.

Claims 1-9 were canceled in the November 24, 2003 response to the first Office action on the merits.

Claims 10-21 were presented in the November 24, 2003 Response.

In the July 3, 2004 AMENDMENT, claims 19-20 were canceled. In the July 3, 2004, AMENDMENT, Claim 16 was amended, and the Advisory Action of October 19, 2004 indicates that so amended Claim 16 would be entered for the purposes of appeal.

## **STATUS OF AMENDMENTS**

The July 2004 AMENDMENT responded to the Final rejection. The October 19, 2004 Advisory Action entered the July 2004 AMENDMENT. However, the Examiner indicated that the amended Claim 16 would be rejectable under 35 U.S.C. §102 over Jacobson et al [ U.S. Patent Nos. 3,426,684 and 3,403,625] The claim amendments presented in the AMENDMENT after final were entered upon the filing of the Notice of Appeal.

## **SUMMARY OF INVENTION**

The appealed claims are set forth in the claims APPENDIX (which begins at page 13 of the BRIEF).

The application is entitled COMBUSTIBLE SHAPED AMMUNITION PART. The invention relates to a combustible shaped ammunition part, such as a propellant case or a propellant charge container, wherein the shaped ammunition part contains an erosion-reducing agent. Page 1 paragraph 1 of the specification

The problem addressed by the inventors is that "[h]igh-energetic propellant powders, such as the ones required for firing high-performance projectiles, generate high temperatures and pressures inside the respective weapon tube and lead to increased wear due to erosion of the weapon tube. " Please see page 1, paragraph 2, of the specification.

Applicants' solution to the problem is set forth in paragraphs 6-7, at page 2 of the specification

6. Solution of the problem according to the invention comprises a combustible shaped ammunition part, such as a propellant case or a propellant charge container, wherein the combustible shaped ammunition part contains an erosion-reducing admixture. The erosion-reducing agent is an oxide of one of the elements of rare earth or one of the elements of the 6<sup>th</sup> subgroup in the periodic system, or a poly oxy methylene (POM). Poly oxy methylene resin(s) are acetal resin(s). These resins can be designated by the empirical formula:



in which  $x \geq 1500$  [ - CH<sub>2</sub> - O - ] units. Brand names of two such resins include "Delrin" and "Celcon."

7 Essentially, the invention is based on the idea of using at least one oxide of one of the elements of rare earth, in particular La<sub>2</sub>O<sub>3</sub>, CeO<sub>2</sub>, Y<sub>2</sub>O<sub>3</sub> and/or at least one element of the 6<sup>th</sup> subgroup in the periodic system, especially MoO<sub>3</sub> or WO<sub>3</sub>, and/or poly oxy methylene (POM), or a combination of these agents as erosion-reducing admixture. **The amount of this reagent(s) can range from 2 to 15% of the composition comprising the combustible shaped ammunition part.**

Please see page 3, paragraph 10 of the specification.

Applicants noted, that in one exemplary embodiment with tungsten trioxide as the erosion -reducing admixture in the propellant case, the erosion of the inside surface of a weapon tube dropped 47%. Please see paragraph 9 at page 2 of the specification.

The surprisingly good erosion-reducing effect of these oxides is presumably due to their ablative effect, which leads to a cooling of the inside wall of the weapon tube from which the respective ammunition is fired. The ablative effect of the oxides is explained through the high negative formation heat  $\Delta H$  of these oxides and the relatively low boiling points. The weapon tube is cooled by the enthalpy of vaporization of these oxides, which are located practically directly against

the inside wall of the weapon tube because of their intercalation into the wall regions of the shaped ammunition part, so that the erosion is lowered noticeably.

To produce the shaped ammunition part according to the invention, 2 to 15 weight % of one or several erosion-reducing agents are mixed into the watery slurry (pulp) of the starting material for producing a shaped ammunition part. Subsequently, the shaped part is produced in the manner known per se (e.g. by using a forming core etc.). Please see page 3 of the specification.

## **ISSUES**

Are Claims 10, 12, 13, 15, 16 [entered as amended by the October 19, 2004 Advisory Action], 18, 19, and 21 anticipated by U.S. Patent Nos. 3,426,684 and 3,403,625 to Jacobson et al.?

Are Claims 11, 14, 17, and 20 unpatentable under 35 U.S.C. 103 over U.S. Patent Nos. 3,426,684 and 3,403,625 to Jacobson et al, in view of Watson-Adams (USP 4,378,256) and Mosser et al (USP 4,724,172)?

## **ARGUMENT**

***"[T]he name of the game is the claim."***

MANUAL OF PATENT EXAMINING PROCEDURE  
[MPEP, 2106.,II C. p 2100-8(line 2), Rev.2 May  
2004,[citation omitted].]

Claim construction is prerequisite to the determinations under Section 102 and 103 of the Patent Statute. This appears to be official policy as enunciated in the MANUAL OF PATENT EXAMINING PROCEDURE [hereinafter "MPEP"], which states:

"Office personnel must first determine the scope of a claim by thoroughly analyzing the language of the claim before determining if the claim complies with each statutory requirement for patentability....[MPEP, 2106.,II C. p 2100-7 Rev.2 May 2004]

Office personnel should begin claim analysis by identifying and evaluating each claim limitation...For products, the claim limitations will define discrete physical structures or materials...." [MPEP, 2106., II C. p 2100-8, Rev.2 May 2004]

"Finally, when evaluating the scope of a claim, every limitation in the claim must be considered. Office personnel may not dissect a claimed invention into discrete elements and then evaluate the elements in isolation. Instead, the claim as a whole must be considered. [MPEP, 2106., II C. p 2100-9, Rev.2 May 2004]

**I. APPLICANTS TRAVERSE THE REJECTION FOR ANTICIPATION OVER THE JACOBSON PATENTS AND RESPECTFULLY REQUEST REVERSAL**

*---The Patent Office claim construction is inconsistent with PTO policy and thus erroneous---*

The U.S. PTO reasons for rejecting claims for anticipation include the statement, "the additive can comprise of 3% of the propellant charge" **(in connection with the analysis of the reference(s))**. Please see the FINAL ACTION, February 3, 2004 Office Action at page 2, paragraph numbered 2.

Applicants' recitation concerning the amount of erosion-reducing agent is not 3% of the propellant charge. Applicants' finally rejected Claims recited:

10. A combustible shaped ammunition part wherein the combustible shaped ammunition part contains an erosion-reducing admixture, comprising an erosion-reducing agent which is an oxide of one of the elements of rare earth or one of the elements of the 6<sup>th</sup> subgroup in the periodic system, or a poly oxy methylene (POM), **wherein the shaped ammunition part contains 2 to 15% of one or more erosion-reducing agent(s)**.

16. (Presented in response to the FINAL ACTION) A combustible shaped ammunition part wherein the shaped ammunition part contains 2 to 15% of one or more erosion-reducing agent(s) and wherein the combustible shaped ammunition part is in the form of a propellant case or a propellant charge container and contains an erosion-reducing admixture, comprising an erosion-reducing agent which is an oxide of one of the

elements of rare earth or one of the elements of the 6<sup>th</sup> subgroup in the periodic system, or a poly oxy methylene (POM).

***A. APPLICANTS INVENTION IS NOT DESCRIBED IN EITHER JACOBSON ET AL PATENTS***

Neither Jacobson patent anticipates applicants' claims. Cf. MPEP Section 2131, as discussed below.

Applicants do rely on MPEP policy to traverse the rejection for anticipation. MPEP Section 2131 is a synthesis of the case law precedent on the requisites of the disclosure of a reference, necessary to constitute an anticipatory reference: that section states that each and every element of the claim must be found in a unitary reference. [Also please see the cases In re Arkley [455 F.2d 586, 172 USPQ 524 (CCPA 1972); In re Samour, 571 F.2d 559, 197 USPQ 1 (CCPA 1978) and In re Marshall 578 F.2d 301, 198 USPQ 344 (CCPA 1978). – relating to the evidentiary information contained in a reference applied under 35 U.S.C. 102---stand for the proposition that (1) the written description of a unitary reference must provide 'written description' of the claimed compound and (2) **the evidence must establish** that contemporaneous with the publication of the compound a person in the relevant art would be enabled to make, to be in possession of, the information provided by the written description. A naming of a compound does not necessarily satisfy the description requirement(s) of case precedent delineating the disclosure requirements of an anticipatory reference. In In re Wiggins [488 F.2d 538, 179 USPQ 421, 424-425 (CCPA 1973), the authors of a reference named specific compounds claimed but indicated that it was impossible for the authors to make

the compounds claimed in the application. Reviewing those facts concerning the express description in the reference, the Court found the naming of compounds in the reference to be merely speculation, rather than written description that placed the claimed compounds within the possession of the public.

## ***B. THE JACOBSON ET AL REFERENCES***

### ***1) Jacobson et al., U.S. Patent No. 3426684***

At column 3 line 8 et seq, Jacobson states:

A further object of this invention is to provide novel additive materials for reducing wear in a gun barrel which are applied in a cartridge, around the propellant charge as by being secured to the inner wall of the cartridge case, to the textile or other like bag containing the propellant charge, directly to the charge, or by being incorporated within the material forming the wall of a consumable casing.

Jacobson et al. Figures 1-13 relate to various embodiments, which the reference describes as follows: Figures 1, 2 and 3 relate to use of a coated fabric to wrap about strips of charge 24. [column 1 lines 30-40] Figure 4 presents an arrangement of inorganic and carbonaceous substances to the charge which the references states "is the same as that described in Figure 1. However, layer 44 is covered with a layer 48 of combustible material such as paper..[column 9 lines 40-47]. Figure 5 has a case 52, charge 56 and an additive layer 64 positioned around the charge on the interior surface of casing 52." At column 6 description of the various Jacobson et al 3426684 figures [1-13], Figure 6 is described as relating to an additive layer 80 which is disposed on the inner surface of case 84 ...without a thin intermediate textile or paper. Fig 7 additive layer 110 dispersed in alkyd resin paint applied to inner wall of the cartridge case. Figure 8 additive in a bat 113 located within textile container 118. Figure 9 Figure 9 comprises an additive layer 132 in a plastic ring located at the upper end of the cartridge case. Figure 10 cartridge is

substantially the cartridge of Figure 7. Figure 11 a coating 42 on the upper part of the charge Figure 12, column 11 line 3 et seq cloth containing powdered aluminum fluoride in about 60% of the dried layer.

At column 8, wax mixtures of additive and wax comprise 67.6 and 40 by weight of wax. The reference states [column 8 lines 45-50] that the proportion of powdered zinc metal or zinc compound to the propellant charge is preferably 0.5-10 percent by weight. At column 4 line 14 et seq it is stated that optimum results were obtained utilizing an additive layer 44 that constituted about 3 percent by weight of the propellant charge.

**2) *Jacobson et al U.S. Patent No. 3403625***

This reference states at column 3 that reduction of wear on a metal member by incorporating material in a cartridge and by suspend a layer forming substance in the hot rapidly flowing gases emanating from the propellant charge, the layer forming substance being produced from a finely divided inorganic substance introduced in the chamber of the firearm behind the projectile and at about or in front of the location of the propellant charge. See claims and Abstract.

Portions of *Jacobson et al U.S. 3426684* also appear in this *Jacobson et al U.S. 3403625*

***C. A DIFFERENCE BETWEEN APPLICANTS' CLAIMS AND THE DISCLOSURE OF JACOBSON IS THAT JACOBSON REFERS TO PROPELLANT CHARGE—AS THE BASIS OF WEIGHT OF ADDITIVE.***

Applicants' claims recite

“shaped ammunition part contains 2 to 15% of one or more erosion-reducing agent(s) [Claim 1].”



Applicants' claims refer to "the combustible shaped ammunition part" [Claims 10 and 16]; or propellant case or propellant charge container [Claims 13-16, and claims dependent on Claim 16 including claims 17-18].

A difference between applicants' claims and the disclosure of Jacobson is that Jacobson refers to propellant charge, as the basis for the amount of additive. By comparison, applicants' claims refer to "the combustible shaped ammunition part" [Claims 10 and 16]---as the basis of amount of additive; propellant case or propellant charge container [Claims 13-16, and claims dependent on Claim 16 including claims 17-18]. Accordingly, the description relied upon by the U.S. PTO **does not establish** a prima facie case of anticipation.

**II. Claims 11, 14, 17, and 20 are patentable: Applicants respectfully request reversal of the rejections based on Jacobson et al patent in view of Watson-Adams and Mosser**

**The secondary references—to Watson-Adams and to Mosser--- do not make out for the deficiencies of the Jacobson et al Patents as they do not describe the erosion-reducing agent of claims 11 and 12, from which claims 14 and 15 depend. The secondary references are irrelevant as they relate to aluminum and aluminum containing coatings.**

***1/ Watson-Adams [U.S. Patent No.4378256 ]***

The reference describes coating aluminum on the surface of gun components on which there is flame impingement. At column 1, line 46 it is stated that the reference method comprise applying to the surface a coating containing aluminium metal and exposing said components to the hot compresses gases formed on firing the gun to diffuse the aluminium into the surface. At column 2 line 14 et seq., the metod comprises coating the internal faces of breech blocks, primer vents and the rear part of the barrel forming the powder chamber with a coating containing powdered metallic aluminium...Firing of the gun causes the aluminium to diffuse into the metal surface [column 2 line 20].

2      ***Mosser [U.S. Patent No. 4724172 ]***

Relates to a coating composition comprising a liquid binder which comprises phosphate ions and ions of the group of chromate or molybdate and an atomized aluminum powder with a specified particle size distribution. The coating is for a machinable aluminum filled thick coating possessing improved salt corrosion and oxidation resistance and bonding strength.

At column 4 line 65 et seq., Mosser refers to *Watson-Adams* as dealing with a past-like composition which are applied to projectiles in order to reduce the erosion of the bores and blocks of rifle artillery.

**The differences between applicants claims and the Watson –Adams and Mosser references and the differences between the Jacobson et al references and the secondary references**

Both Watson-Adams and Mosser relate to aluminum coatings. The U.S. PTO agrees with that analysis:

"Watson-Adams teaches a coating that is applied to the surface of projectiles. This coating causes an aluminum surface layer to build up inside the barrel and reduces the erosion of the metal inside the gun barrel.

. Page 3 of the final rejection of February 3, 2004

Mosser et al teaches an improvement over the invention of Watson-Adams by using ceramic coatings as a better way to prevent metal erosion. These materials include cerium dioxide. . [ Page 3 of the final rejection of February 3, 2004]"

By comparison, Applicants' claims relate to combustible shaped ammunition part(s).

**III. Combination of Watson-Adams and Mosser with either of the Jacobson et al patents does not lead to the rejected claimed combination.**

Applicants traverse the rejections for obviousness under Section 103(a) of the Patent Statute. Since clearly there is a difference between the Jacobson patents and the instantly rejected claims, for reasons set forth above, the next determination under Section 103 relates to the level of skill in the art.

In fact, there is no description in any of the references that the content of erosion-reducing admixtures should be between 2 and 15% of the material in the combustible case. In summary, (a) there is no teaching and the Examiner has presented no rationale to combine the references (b) to arrive at the present invention; and (c) there is no teaching in the references that would lead one to expect the superior properties demonstrated by the invention.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

**1] Jacobson et al inter alia state**

A further object of this invention is to provide novel additive materials for reducing wear in a gun barrel which are applied in a cartridge, around the propellant charge as by being secured to the inner wall of the cartridge case, to the textile or other like bag containing the propellant charge, directly to the charge, or by being incorporated within the material forming the wall of a consumable casing. [Jacobson et al. U.S. 3426684 Col. 3 lines 8 et seq., excerpted from above]

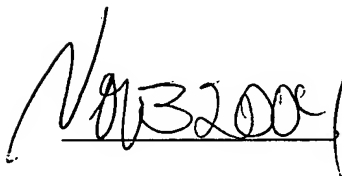
In applicants' view, if 'combination' of the references were proper, it would not lead to applicants invention.

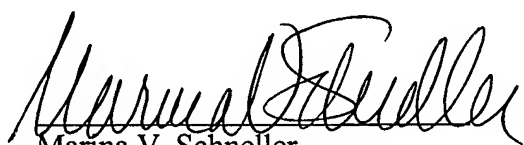
Although applicants do not assume the following, it is possible that the U.S. PTO Examiner's reasoning is that 3% of Jacobson et al.'s propellant charge renders obvious 2-15% additive of the shaped combustible case. Applicants' do not believe a person of ordinary skill would make that leap: Logical extrapolation of the U.S. PTO reasoning would mean: If the propellant charge of a large-caliber cartridge has a weight of, for example, 8 kg, then Jacobson proposes adding approximately 240g of  $\text{WO}_3$  to the propellant charge. If the combustible case of such a cartridge weighs 600g, for example, it appears that the U.S. PTO believes that, the art would have suggested itself to the average person skilled in the art to add 18g of an erosion-reducing admixture to the case instead of adding 240g to the propellant charge. *The 18g is 7.5% of 240 grams.*

Apart from the fact that such a conclusion does not follow from Jacobson, it is not logical to conclude that **18g of the admixture in the combustible case** has approximately the same effect as *240g of an admixture in the propellant charge*.

Reversal of the Final Rejection is respectfully solicited.

Respectfully submitted,

 2004

  
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## CLAIMS APPENDIX

### LISTING OF CLAIMS

#### Claims 1-9 (Cancelled)

10. (Previously presented) A combustible shaped ammunition part wherein the combustible shaped ammunition part contains an erosion-reducing admixture, comprising an erosion-reducing agent which is an oxide of one of the elements of rare earth or one of the elements of the 6<sup>th</sup> subgroup in the periodic system, or a poly oxy methylene (POM), wherein the shaped ammunition part contains 2 to 15% of one or more erosion-reducing agent(s).

11. (Previously presented) A combustible shaped ammunition part according to claim 10, wherein the erosion-reducing agent is  $\text{La}_2\text{O}_3$ ,  $\text{CeO}_2$ , or  $\text{Y}_2\text{O}_3$ .

12. (Previously presented) A combustible shaped ammunition part according to claim 10, wherein the erosion-reducing agent is  $\text{MoO}_3$  or  $\text{WO}_3$ .

13. (Previously presented) A combustible shaped ammunition part according to Claim 10, in the form of a propellant case or a propellant charge container.

14. (Previously presented) A combustible shaped ammunition part according to Claim 11, in the form of a propellant case or a propellant charge container.

15. (Previously presented) A combustible shaped ammunition part according to Claim 12, in the form of a propellant case or a propellant charge container.

16. (Currently amended) A combustible shaped ammunition part wherein the shaped ammunition part contains 2 to 15% of one or more erosion-reducing agent(s) and wherein the combustible shaped ammunition part is in the form of a propellant case or a propellant charge container and contains an erosion-reducing admixture, comprising an

erosion-reducing agent which is an oxide of one of the elements of rare earth or one of the elements of the 6<sup>th</sup> subgroup in the periodic system, or a poly oxy methylene (POM).

17. (New) A combustible shaped ammunition part according to claim 16, wherein the erosion-reducing agent is  $\text{La}_2\text{O}_3$ ,  $\text{CeO}_2$ , or  $\text{Y}_2\text{O}_3$ .

18. (Previously presented) A combustible shaped ammunition part according to claim 16, wherein the erosion-reducing agent is  $\text{MoO}_3$  or  $\text{WO}_3$ .

19. (Canceled).

20. (canceled)

21. (canceled)